

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP03/15742

**A. CLASSIFICATION OF SUBJECT MATTER**  
Int.Cl<sup>7</sup> H01S3/105

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
Int.Cl<sup>7</sup> H01S3/00-5/50

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
Jitsuyo Shinan Koho 1922-1996 Toroku Jitsuyo Shinan Koho 1994-2004  
Kokai Jitsuyo Shinan Koho 1971-2004 Jitsuyo Shinan Toroku Koho 1996-2004

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
WPI (DIALOG), INSPEC (DIALOG), JOIS (JICST FILE)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2-307285 A (Komatsu Ltd.), 20 December, 1990 (20.12.90), Full text; Figs. 1 to 10 (Family: none)	1, 2, 7
X	JP 5-283785 A (Komatsu Ltd.), 29 October, 1993 (29.10.93), Full text; Figs. 1 to 11 (Family: none)	1, 2, 7
X	JP 6-104520 A (Komatsu Ltd.), 15 April, 1994 (15.04.94), Par. Nos. [0013] to [0015]; Fig. 2 (Family: none)	1, 2, 7

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

<p>* Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&amp;" document member of the same patent family</p>
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Date of the actual completion of the international search  
08 March, 2004 (08.03.04)

Date of mailing of the international search report  
23 March, 2004 (23.03.04)

Name and mailing address of the ISA/  
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

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## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 11-214803 A (Komatsu Ltd.), 06 August, 1999 (06.08.99), Par. No. [0041]; Fig. 3 (Family: none)	1,2,7
X	WO 01/18922 A1 (CYMER, INC.), 15 March, 2001 (15.03.01), Full text; Figs. 1, 2, 6, 9 to 11 & JP 2001-168440 A	1,2,7
X	WO 01/59889 A1 (CYMER, INC.), 16 August, 2001 (16.08.01), Full text; Figs. 10, 12 to 14 & JP 2001-267673 A	1,2,7
X	JP 2001-332793 A (Komatsu Ltd.), 30 November, 2001 (30.11.01), Par. No. [0021]; Fig. 1 (Family: none)	1,2,7

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## Box I Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:

because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:

because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:

because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Although claims 1-13 have a common matter that "laser device comprising a laser resonator including an adaptive optics, a laser medium disposed in the laser resonator, and a dispersion element for receiving an output light from the laser medium", our search has found the common matter is disclosed in either one of the following documents and therefore is not clearly novel. Document 1: JP 2-307285 A (Komatsu Ltd.), 20 December, 1990 (20.12.90), Full text; Figs. 1 to 10 (family none).  
(Continued to extra sheet)

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1, 2, 7

Remark on Protest ☐ The additional search fees were accompanied by the applicant's protest.  
☐ No protest accompanied the payment of additional search fees.

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## Continuation of Box No. II of continuation of first sheet(1)

Document 2: JP 5-283785 A (Komatsu Ltd.), 29 October, 1993 (29.10.93), full text; Figs. 1 to 11 (family none).

Document 3: JP 6-104520 A (Komatsu Ltd.), 15 April, 1994 (15.04.94), Par. Nos. [0013] through [0015], Fig. 2 (family none).

Document 4: JP 11-214803 A (Komatsu Ltd.), 06 August, 1999 (06.08.99), Par. No. [0041]; Fig. 3 (family none).

Document 5: WO 01/18922 A1 (CYMER, INC.) 15 March, 2001 (15.03.01), full text; Figs. 1, 2, 6, 9 to 11 & JP 2001-168440 A.

Document 6: WO 01/59889 A1 (CYMER, INC.) 16 August, 2001 (16.08.01), full text; Figs. 10, 12 to 14 & JP 2001-267673 A.

Document 7: JP 2001-332793 A (Komatsu Ltd.), 30 November, 2001 (30.11.01), Par. No. [0021]; Fig. 1. (Family: none)

Consequently the common matter is not a special technical feature within the meaning of PCT Rule 13.2, second sentence, since it makes no contribution over the prior art.

Therefore, there exists no special technical feature common to all the claims 1-13.

Accordingly, it is clear that claims 1-13 do not fulfill the requirement of unity of invention.

The above inventions are classified as:

(1) Claim 1 relates to the above common matter described in either one of the documents 1-7. Claim 2 and claim 7 referring to claim 2 relate to a laser device, or the above common matter, in which an output light from a laser medium enters the mirror of an adaptive optics, a light reflected off the mirror of the adaptive optics enters a grating, and a diffractive light from the grating is reflected off the mirror of the adaptive optics to enter a mirror having a specified transparency, and in this respect, claim 2 and claim 7 referring to claim 2 constitute a group of inventions so linked as to form a single general inventive concept.

(2) Claims 3, 6, and claims 7 and 8, 9, 12 referring to claim 3 or 6, and claim 13 referring to either one of claims 8, 9, 12 relate to a laser device, or the above common matter, in which an output light from a laser medium enters a grating, a diffractive light from the grating enters a mirror of an adaptive optics, and a light reflected off the mirror of the adaptive optics is diffracted by the grating to be allowed to reciprocate within a laser resonator, thereby effecting laser oscillation, and in this respect, claims 3, 6, and claims 7 and 8, 9, 12 referring to claim 3 or 6, and claim 13 referring to either one of claims 8, 9, 12 constitute a group of inventions so linked as to form a single general inventive concept.

(3) Claim 4, and claims 7 and 10 referring to claim 4, and claim 13 referring to claims 10 relate to a laser device, or the above common matter, in which an output light from a laser medium enters a prism, a light spectrally separated by the prism enters the mirror of an adaptive optics, and a light reflected off the mirror of the adaptive optics is allowed to reciprocate within a laser resonator, thereby effecting laser oscillation, and in this respect, claim 4, and claims 7 and 10 referring to claim 4, and claim 13 referring to claims 10 constitute a group of inventions so linked as to form a single general inventive concept.

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Continuation of Box No. II of continuation of first sheet(1)

(4) Claims 5, 11 and claim 13 referring to claim 11 relate to a laser device, or the above common matter, in which an output light from a laser medium enters the mirror of a first adaptive optics, a light reflected off the mirror of the first adaptive optics enters a double refraction filter, a light passed through the double refraction filter enters the mirror of a second adaptive optics, and a light reflected off the mirror of a second adaptive optics is allowed to reciprocate within a laser resonator, thereby effecting laser oscillation, and in this respect, Claims 5, 11 and claim 13 referring to claim 11 constitute a group of inventions so linked as to form a single general inventive concept.

Accordingly, the number of inventions in this international application is four.